

# Simple Mechanics to Achieve Success

*Presented by XC-T&F Coach Ron Knapp, at The Running Academy Cross Country Camp, August 16, 2022*

As a coach with doctoral studies in biomechanics I spend a great deal of time focused on watching how athletes run and walk. Biomechanics is the study of the mechanics of biological and muscular activity. In other words, the study of your body in motion to improve performance in a given sport as well as reduce injury.

And with cross country running, there are a few simple mechanics to observe and then practice that can make differences in improving your performances.

Please be patient with me as we take a quick look at some of the terms we will review and apply to an analysis of your running mechanics.

When looking at someone running or walking, I am always trying to relate that movement in 3 major concepts.

1. **MOTION:** the movement of the body or an object through space.  
-> This is easy to relate to our sport as your body in moving through a space across hills, flats, on grass, on road, on soft paths.
2. **FORCE:** is a Push or Pull that causes you to speed up, slow down, stop or change direction.  
-> Easily applied to cross country as you are always pushing OFF a surface while trying to negate the PULL of gravity.
3. **MOMENTUM:** is the product of weight and its velocity when moved.  
Your effort to start running and keep running is your dominant goal, hopefully at a sustained pace while negotiating the various course surfaces and terrain.

So now that we have a working vocabulary, let's find out how we use our new knowledge to help you enhance your performance AND reduce injury.

Since the development of your physical conditioning (physiology) to handle more stress at faster speeds takes consistency over a period so too does the improvement of your running mechanics. IT DOES NOT HAPPEN OVER NIGHT, OVER A WEEK or a MONTH but a gradual progression.

## 5 SIMPLE TO DO's – Toe to Head:

**Foot Strike:** Heel to midfoot then toe, with a top sprint speed on the balls of your feet. *If you hear your foot slapping the surface, then you are inviting lower leg injuries like shin splints.*

**Lower Leg Cycle:** as your foot pushes off from the ground, you toe should snap back up toward the shin as your lower leg and your heel moves up under your hamstring to complete a rhythmic cycle.

Let **momentum** help you as you trace the circle rather than the ellipse, *shorter levers require less effort.*

IF you don't pick up your heel and only pull your foot through then you are using larger muscles (quads/hamstrings) in an unnecessary effort that causes early fatigue.

**Forward Hip Placement:** Your hips (center of gravity) should be slightly forward of your foot strike so that you are *falling forward using gravity instead of working against it.*

Leaning back means that you have to pull your weight over against gravity on each stride.

**Open Chest and Relaxed Arm Swing:** the advantage to an easy arm swing where your arms don't cross the center line helps you keep your shoulder up and chest open to breathe more efficiently.

Crossing arms across the chest invites a hunched posture that closes your lung space to the *vital oxygen your muscles need to sustain your effort.*

**Head Up & Eyes Focused Ahead:** Keeping your head up and eyes focused 5 to 10 feet ahead of you improved your ability to keep your throat open to intake as much oxygen as possible.

Every time you dip your head to look down you cut off your airway.